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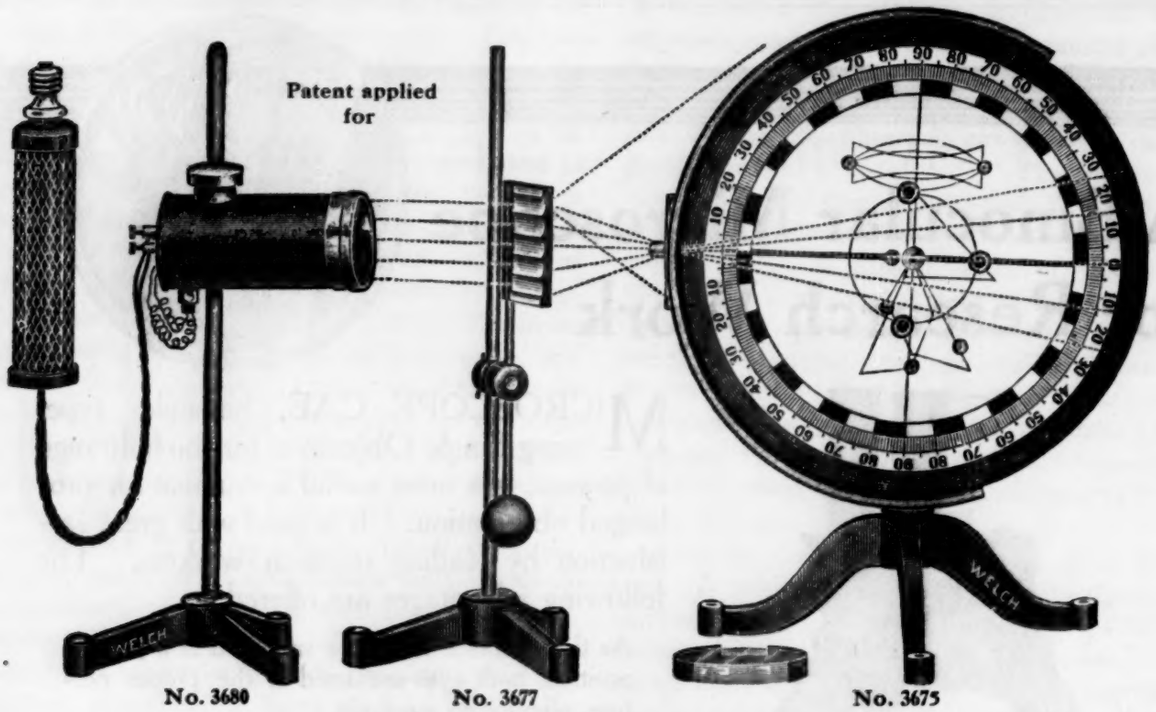

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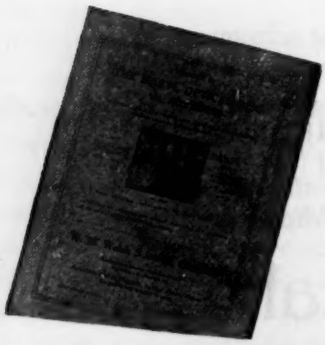

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FRIDAY, FEBRUARY 18, 1921

CONTENTS

The American Association for the Advancement of Science:—
The Practical Value of Anthropology to our Nation: PROFESSOR ALBERT ERNEST JENKS. 147

A Brief Historical Consideration of the Metric System: DR. LOUIS C. KARPINSKI..... 156

Scientific Events:—
The Annual Meeting of the Board of Trustees of the American Museum of Natural History; Expeditions and Acquisitions of the American Museum; The Biological Field Station of Cornell University; American Foundation in France for Prehistoric Studies 157

Scientific Notes and News 160

University and Educational News 163

Discussion and Correspondence:—
On the Occurrence of Aëdes sollicitans in Fresh Water polluted by Acid Waste: SAMUEL F. HILDEBRAND. *The History of Science and the American Association for the Advancement of Science:* PROFESSOR FLORIAN CAJORI. *Concerning "Aerial Photo-hydrography":* DR. WILLIS T. LEE. *Soil Color Standards:* J. G. HUTTON..... 163

Scientific Books:—
The Letters of William James: PROFESSOR EDWARD L. THORNDIKE..... 165

Special Articles:—
Non-disjunction of the Fourth Chromosome of Drosophila: DR. C. C. LITTLE 167

The American Association for the Advancement of Science:—
Report of the Treasurer; Financial Report of the Permanent Secretary 167

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THE PRACTICAL VALUE OF ANTHROPOLOGY TO OUR NATION[1]

THE last few years have taught American scientists the lesson of service to our nation in time of crisis. It had seemed to be a condition of our American civilization that the vast bulk of our people spent their energies solely on their private interests. Most of these private interests were producing things demanded and sold in the market, hence were esteemed at all times of practical value. A science which did not benefit commodities hawked and sold in the public market was given only scant passing notice. This condition has had much to do with the slowness of certain sciences in developing their practical phases. But in our time of national peril it was demanded of every science that to the utmost limit of its practical possibilities it be useful to the state. So great was the impetus given to the development of the practical side of scientific research that in pragmatic America of this hour a science which can not develop its practical side of service to its nation and to its day can not long retain respect among other sciences.

It is probably true, as Earl Gray said, that nationalistic statesmen are largely opportunists who see only a little way ahead, and who are entitled to congratulate themselves if they steer their powerful nations safely among the rocks and bars which appear unexpectedly in the uncharted course along which they sail. A long look at nations as they have come and gone reveals the tragedies of the opportunist statesmen. In modern times the nations of the old world seem to have had their courses quite largely projected into the future by the inevitable continuity of a long historic past. Yet we now see their statesmen too were largely

[1] Address by the vice-president and chairman of Section H (Anthropology), of the American Association for the Advancement of Science, at Chicago, December 28, 1920.

only opportunists; they could not foretell the future. Since this is true, can Americans easily overstress the need our nation has of all data obtainable to assist her along her course so infinitely new?

I have no hesitation in saying that of America's recognized problems those most unique, and most difficult to foresee in solution are anthropological at base. Because of these problems confronting America our anthropologists have the opportunity and the duty of service to our nation second to no other group of scientists. I put them first.

Psychologists have given us the scientific procedure for thinking through great problems: *First,* there must be a clear statement of the problem; *second,* the accumulation of all obtainable data; *third,* a survey of the accumulated data with all possible judgment and guided imagination, resulting in conclusions which, after constant efforts at refutation and verification, should furnish grounds for future action. I fear that we as anthropologists have sometimes stopped at the second point without going on to the most vital part of the procedure covered by the third. A step further than this is necessary, however. In a nation with government by public opinion and universal franchise any conclusions which are to affect national policies and actions must be so popularized that an educated public opinion will irresistibly dominate the nation in questions affected by these conclusions. Public opinion so engendered concerning anthropological questions would put their solution in the scientific class—that of deliberative thought and action. It would take their solution out of the disreputable but still existing class of chance or luck; and out of the still more common but extremely wasteful class of trial and error. From anthropologists should come the data, as far as possible the conclusions, and to a certain extent the programs for the solutions of our national problems which have an anthropological basis.

We shall not have time in one brief paper to state all the anthropological problems whose solution would be of practical value to our nation. I wish to touch in a general way on the fundamental value to our nation of practical anthropological research as a whole and then to pass on to a more extended discussion of the relation of anthropology to two of the gravest problems before the nation to-day.

Stated broadly the bed-rock national anthropological problem is the survival and improvement of the human element of our nation. The *sine qua non* of civilization at any time is man's survival on physical, intellectual, and moral planes as high as those he possessed at that time. Civilization is lost to the extent that man's survival-planes are lowered. The goal of civilization seems to be for increasing numbers of mankind to survive on more elevated planes of mutual physical, intellectual and moral freedom. It appears to be a part of cosmic evolution for each generation to press toward that goal. But to a large extent even to-day our generation is pressing blindly toward this goal with its mind on remedial factors rather than on causative factors. There is a pertinent question and its answer in Ellsworth Huntington's new book, "World-Power and Evolution":

> Shall we despair because the church, the school, the charity organization, and the state have not yet destroyed war, pestilence, lust, greed, cruelty and selfishness? Far from it. These agencies can not possibly play their proper parts unless science comes to their aid.

The time has come when anthropologists who study breeds of men from the disinterested scientific point of view should help create dominating constructive public opinion founded on research to assist our nation toward her goal of developing civilization.

In my "Report on the Science of Anthropology in the Western Hemisphere and the Pacific Islands," published by the Carnegie Institution of Washington in 1914, I discussed this question at some length under the section with the general title of "Modern Problems" and the sub-titles of "Ethnic Heredity," "Influence of Environment on Mankind," "Human Amalgamation," and "An Anthropological Laboratory." I here quote from the opening and closing paragraphs of that section of the "Report":

It must not be supposed that the anthropologist is limited in his interest and his field of work to man's evolution of the past. He knows man is still in the making. He studies man's present-day evolution in its individual and ethnic aspects. He makes his studies of both the past and the present, with an eye to the future, in order that those things which vitiated or benefited the evolutionary process in the past, and which vitiate or benefit it to-day, may serve as guides for future generations.

The field of anthropological study of modern people is new and unoccupied, only the barest beginnings having been made. The horizon of this coming field for research among present and future man and ethnic groups is seen to extend indefinitely into the future. It would be difficult to overestimate the practical value of these continued studies. Their utility would be world-wide.[2]

A permanent laboratory should eventually be established in connection with these studies in ethnic heredity, environment, and amalgamation where records of research would continually accumulate and where they would be kept indefinitely. From this laboratory new data should be published frequently, not alone for conclusions which might have been arrived at, but that such data might assist investigators in various parts of the world. . . .

It may be argued that, even were the facts of heredity, environment, and amalgamation obtained and available, they would be of little use to-day, since influences are already at work which would be impossible to control. To a certain extent this is true, but one of the essentials of human progress is that man works not for his own generation alone, but for future generations. One can not measure the beneficial results to future generations of a body of accurate and scientific facts available on these subjects. Moreover, facts of this kind to-day in America become a part of educated public opinion surprisingly soon, and have their inevitable and far-reaching influences.[3]

The president of the Anthropological Section of the British Association for the Advancement of Science in his recent address at Cardiff emphasizes in no uncertain terms the necessity of making anthropological research of service to the nation, and urges the establishment of "anthropological institutes" in British universities to further this end.[4]

There can be no question of the service anthropological knowledge and research might render to the United States to-day.

In the improvement of plants and animals in the economic life of the United States our experts are constantly at work using as their ready tools every latest fact of scientific knowledge. We have carefully studied, selected and improved the native American maize, potatoes, yams, tobacco and turkey, and built them into our everyday life.

The United States government keeps in constant employ experts who in recent years have imported many varieties of plants and animals which are successfully and permanently built into our economic production.

Among such plants, I quote from a personal letter received from Dr. Fairchild, Agricultural Explorer in Charge, United States Department of Agriculture, Bureau of Plant Industry, Washington, D. C., "are the durum wheat brought since 1898 from Russia with now an annual value in increased wealth to the farmers of the United States of $50,000,000, the Sudan grass imported in 1909 from the Sudan with a crop in 1918 valued at more than $10,000,000, the Rhodes grass from Rhodesia, represented now by an industry of several millions, the feterita from the Sudan, which since 1906 has grown to an industry of over $16,000,000 annual value, the Egyptian long staple cotton, which since 1899 has become an industry worth over $20,000,000 in southern California, the soy bean crop, which to-day amounts to six and one third million dollars, and the newer things, such as the avocado, the dasheen, the chayote, the Chinese jujube, the Oriental persimmon, the Japanese bamboo, the tropical papaya, the Japanese rices, which cover now 60,000 acres of land in California alone."

To this list must be added the date brought from the Sahara or the deserts of Arabia. It

[2] Page 54 of "Reports upon the Condition and Future Needs of the Science of Anthropology," presented by W. H. R. Rivers, A. E. Jenks, and S. G. Morley, at the request of the Carnegie Institution of Washington, printed 1914.

[3] Page 58, *ibid.*

[4] "Institutes of Anthropology," by Professor Karl Pearson, in SCIENCE, October 22, 1920.

was estimated in 1919 that there were 200 acres of date palms already established in the Coachella and Imperial Valleys of California. Concerning this industry Dr. Fairchild says not only have our experts "been instrumental in building up this industry, but their study of the methods of propagation, the diseases and methods of their control, the insect pests and the requirements of the date palm constitute the largest collection of exact data now in existence in regard to this industry, and the Old World has had to come to America for the latest information in regard to this industry. Too great emphasis can not be placed upon this accomplishment and the manner in which he [Mr. Swingle] has brought it about. It represents in my mind one of the most remarkable pieces of agricultural work which has been done in recent times."

Among the recent most successful animals imported into the United States are the Aberdeen-Angus cattle, the Herefords, and the Belgian draft horses. Among the Hereford cattle, solely since 1901, America has developed a polled or hornless variety which has added another virtue—that of early maturity, thus producing "baby beef."[5]

Thus through national, state, county and private expenditure of millions of dollars annually, we now have as integral parts of our economic life scores of plants and animals which were alien importations only a few years ago. Over extensive areas there is so much of common knowledge about these plants and animals that as public opinion it dictates common policies and practises.

Shift the picture just a little. While we carefully nurtured many of our native plants, the native Indians who were here so long that they had become a distinct breed of mankind, and who in thousands of years of adjustment to American conditions had fitted American environmental areas better than did their plants, we either slew, or as remnants segregated as enforced dependents, not only robbing them of their native life which had developed their own peculiar strengths, and preventing them from building into the common life of America, but condemning them to sure deterioration. A scientific study of the American Indians as the men who had adjusted themselves to American environments for thousands of years would have been reasonable. What elements of strength, resistance or immunization had those men developed to have so long withstood the varied harshness of our American environment? Perhaps these qualities may be seen to be the prerequisites of permanent survival in America. The American plant breeder has long made use of hardy native plants to make his more prolific hybrids more resistent to cold, drought, disease and insect pest. Had we been as intelligent in the matter of the Indians as we have been with plants and animals there is little question that conditions would have been better for the Indians, and they might have added desirable strength to our nation.

Again shift the picture. While we have imported so many plants and animals, and with scientific knowledge and care have built them into our common life, there have been coming to our shores, of their own volition, peoples from over the earth of many breeds and many cultures who have distributed themselves here in many different environmental areas. In striking contrast with our state of knowledge about imported plants and animals we possess almost no scientific knowledge about these peoples such that it has become public opinion even among educated persons—to say nothing about its dictating nation-wide policies and practises.

I wish to state again as I stated in 1914, but with added emphasis, the imperative need in America of scientific research among modern peoples along the lines of ethnic heredity, environmental influences, amalgamation and assimilation, and the need of laboratories to further this research and conserve its results. That we to-day should have abundant laboratories for practically every science except anthropology, and ignore the richness of the

[5] Personal letter from George M. Rommel, chief, Animal Husbandry Division, U. S. Department of Agriculture, Washington, D. C.

materials in our midst for anthropological studies of practical value to our nation is a mistake whose consequences will be far-reaching in their disaster. "Legislation which ignores the facts of variation and heredity must ultimately lead to national deterioration," said the British birth-rate commission in 1917.[6] Every day henceforth in the life of the American nation anthropological data should be recorded just as our Treasury Department daily keeps its fingers on the financial pulse of the nation. In leaving this point I quote as a pertinent scientific fact of to-day a sentence from Pearson's recent address at Cardiff above referred to: "The future lies with the nation that most truly plans for the future, that studies most accurately the factors which will improve the racial qualities of future generations either physically or mentally."[7]

We come now to the first of the two problems vital to America which we wish especially to consider.

Mr. Frederick A. Wallis, Immigration Commissioner at the port of New York, recently said that the greatest problem before America to-day is the Immigration Problem. The whole nation is coming to a realization of the truth of this statement. The seriousness of the problem is equalled only by our lack of data, our lack of methods and technique, our general ignorance in dealing with it. Ferrero, the Italian historian, recently said:

> My first surprise [on coming to the United States], and a very great one it was, arose from my examination at close quarters, of the policy pursued by the United States in dealing with the immense hordes of immigrants, who yearly pour into their harbors from all parts of the Old World.

This question was of especial interest, as he said, "to a historian of Rome, like myself, to whom history has taught the great internal difficulties which were caused in every ancient state by the *metoipoi* or *peregrini* [*i.e.*, aliens]."[8] This great problem of the admission, the distribution, and the assimilation of the immigrant in America is at base anthropological.

Ethnic groups differ one from another. It is commonly supposed to be true that their differences are only "skin deep," but you and I know that ethnic groups differ beneath the skin. We know that the processes of pigment metabolism are so unerring and persistent that patches of skin taken from one person and grafted on another take on the proportion of pigmentation natural to the "stock" or seat on which the transplanted skin lives. We know also that ethnic differences are so much more than only "skin deep" that ovaries transplanted from one person to another person would reproduce children of their own kind without influence by the person who served as "stock" or seat for the transplanted ovaries. There are no experiments of this sort known to me, but what has been proved true with other animals would without question be true of human animals. Thus there is scientific reason to speak of different "breeds" of people whose differing physical characteristics are to-day due to the factors of heredity resident in the reproductive germ cells. Ethnic differences are not simply "skin deep." They are germinal. They begin at the functional innermost center of the person, and they continue through to the outside. The man who runs sees the outside differences between breeds of people. The anthropologist knows they begin inside in the seeds of the breeds.

Out of the physical man grows the psychic man. As out of these different physical characteristics of the different breeds of people come the psychic characteristics of those breeds of people, it should be expected that the reactions of the different breeds of people would exhibit differences. The practical handler of peoples knows such is the case—whether he is an administrator of colonies, a policeman in any large cosmopolitan city, or boss of a gang of mixed "foreigners" on any American railway job. At the present moment

[8] Pages 139–140, Guglielmo Ferrero, "Ancient Rome and Modern America," 1914.

[6] Page 45, "The Declining Birth-rate by the National Birth-rate Commission," London, 1917.

[7] Page 376, "Institutes of Anthropology," by Professor Karl Pearson, SCIENCE, October 22, 1920.

it can not be said that these differing reactions of the different breeds of men are due to physical differences or to psychic differences or to social and cultural differences, or to something yet unnamed. All that is known is that different breeds of people commonly possess distinguishing reactions in many of the affairs of life.

The American immigration problem is centered in the various breeds of people who are clamoring to come to our shores or who are already in our midst. What facts and tendencies of strength and weakness for the future of the American nation are in those various ethnic groups? On the answer to this question hinges the whole immigration problem. It is a question for the most careful study, the accumulation of accurate data, and for effort at scientific conclusions on the part of anthropologists in order that an intelligent public opinion based on known facts, instead of sentiment or prejudice or commercial profits for the few, may dictate our policies and practise in regard to the peoples coming to us or already here. Some peoples can, do, and will continue to build into the American plan of development. Others do not, and should not be expected so to develop without due education and often tedious application. Others probably never would. We must have a public opinion on this question based on scientific facts as to the relative assimilability of the various peoples already here, and also on the actual attitude of the leaders of the several groups toward the necessary American goal of rapid and complete assimilation. If further immigration is to be allowed or encouraged, the national policy should welcome those groups most favorable to assimilation, and should restrict those unfavorable to assimilation.

So also in the problem of the distribution of immigrants in America wise use should be made of anthropological data. Practically each one of the peoples coming to us from Europe has lived for many generations in one type of environment, in many cases has pursued one kind of employment, so it has developed rather fixed reactions which have saved it. The anthropologist should be able to put at the service of the nation such knowledge of European environments and peoples and of American environmental areas that the different immigrant peoples could be sent to, or educationally advised to go to, those areas and employments most likely to prove helpful rather than injurious to the immigrating generation.

Let me cite a few illustrations of immigrant distribution personally known to me. A group of well-to-do Holland-Dutch farmers was brought as entire families with some thousands of dollars each from the wet alluvial lands of Holland, and planted in the sand of a northern Minnesota county on farms previously selected for the colony. Those families did not know how to farm on land which leaches dry in a few hours after a light rain, and which in the hot growing period of July and August could profit by heavy rains every other day. In ten years' time the members of that colony of industrious and hopeful immigrants who came to us prosperous farmers are scattered, their accumulations wasted, and, disillusioned, they work for a wage where they can.

Between 1850 and 1860 a small group of Finns came from the copper mines of Sweden to northern Michigan to work in the Calumet and Hecla mines. Since that time, particularly since 1900, northern Michigan and especially northern Minnesota have attracted many Finns from Finland. I know well their homes in Minnesota. There they find as nearly as well may be an environment identical with that of Finland. It is a heavily glaciated area with ridges of drift strewn with immense bowlders. Glacial lakes, marshes and small streams are everywhere. The forest is "Canadian" and identical with that of Finland. Other peoples, even the Scandinavians, have passed by those rough lands with their ridges and marshes, which the Finns actually seek out. There they continue to settle, clear the forests and make small farms. They are productive immigrants, happy and successful in their own sort of familiar climate, forests, soil and country life. I know some of them who

are joyous on those farms after having lived some years in the hustle of our Twin Cities. The Finns found their own environment by accident.[9]

The German-Russians also by accident went to the open plains of the Dakotas, and there in areas so like their Russian farms they have become contented and many are wealthy farmers. The chief adjustment they had to make was to larger farms, and American citizenship and language. While around many of the extensive mines and plants of our fundamental industries the Slavic-Russians are struggling to adjust themselves from the open-air life of Russian farms to the intense breathless life of the industrial gang. Many of those Slavs have been as misplaced as were the Holland-Dutch. With expert care and study we put our imported plants and animals in the areas to which they are best adapted, but we allow the peoples coming to us to go where chance or material profit for the moment leads them.

The results of anthropological and environmental researches in Europe and America could be so popularized as to become important factors in the matter of immigrant distribution, and so assist in checking the growing and fatal disease of urbanization in America.

The problem of the assimilation of our immigrant peoples has become of such importance in the last few years that it has attracted nation-wide attention and started a nation-wide movement known as Americanization. It is in this field of national endeavor that anthropology has an opportunity for paramount service to our nation. I wish in discussing this point to bring to you not simply a theory of what might be done but to tell you what actually has been done along this line in the University of Minnesota. Two years ago I presented a paper before this section in Baltimore on the plan then recently passed at the University of Minnesota to attempt to make a practical application of the science of anthropology to the great Americanization problem about which the whole nation was so much concerned and yet at the same time about which it was so much bewildered as to practical methods of approach.

The Americanization Training Course has now been established at the University of Minnesota for more than two years. Its object is the training of Americanization leaders to hasten the assimilation of the various peoples in America toward the highest common standards and ideals of America practicable for that generation. The course is founded on our anthropology courses which have been developing in our university for fourteen years. Those courses consisted not only of the usual foundation courses on the development of man, races and culture, but of courses dealing with modern anthropological problems especially those of vital importance to our immigrant nation. They have dealt with the peoples who have come and who are coming to America as immigrants, and with the negroes who came as slaves. They also dealt with the resulting peoples in America due to amalgamation and adjustment, and those psychic results so essentially American that we called them "Americanisms." On the establishment of the training course these courses were emphasized and developed, and on top of them we developed professional courses on the technique, the method, and the organization of Americanization work, also technical courses on the principles of adult elementary education, the adult elementary learning process, and the adult elementary teaching process, and also such practical field courses as supervised work with foreign peoples in homes, residence communities, industrial plants, public schools, etc. There have been difficulties, since we were so largely in an untried field. Some of the courses of necessity were at first only experimental. Instructors had not always all the training we might have wished. But the contact with workers in the same field, especially as we have been able to bring them in during our summer sessions, when they have come as instructors and students from New York, California, and cen-

[9] "The Finn in America," by Eugene Van Cleef. Reproduced from *Bulletin of The American Geographical Society*, 1918.

ters in our middle states, has given a splendid impetus to the development of the work to-day.

The practical value of modern anthropological knowledge can no longer be questioned by one who knows the practical work done by those who have gone out from the training course. We have sent our trained Americanization leaders into several different states and into many different positions, such as those of state directors, city directors, school directors, directors with Y. M. and Y. W. C. A., churches, women's clubs, and as teachers in schools, homes, communities and industries. The continuous demand for these trained leaders is greater than our supply, and a gratifying aspect of this demand is that it so often comes from centers where already some of our trained workers are. Our trained leaders are making good in this practical effort to hasten assimilation in America, not only because they are trained in the professional, technical and practical courses, but, more especially, because through their anthropological courses they are equipped to know the different necessary approaches to, and reaction of, the different breeds of peoples among whom they work. Their work is among peoples. They have been trained to know peoples. This training course is not yet fully manned or as complete as is desired due to the almost universal shortage of funds in higher education. We need especially research men in physical anthropology, amalgamation, and environmental influence, as well as experts in certain practical fields. In fact, there should develop a genuine laboratory of research and of practical application of anthropological knowledge. The time is coming quickly when this will be developed somewhere.

Not only is this work being done in the University of Minnesota but under the impetus of the Americanization movement many colleges and universities which before had no anthropology courses of any nature have recently been putting in courses on modern peoples, especially our immigrant peoples, and some have added various professional courses on technique and method. Not only are these anthropology courses of value in purely Americanization work, but it will come to be recognized more and more that with America's vast heterogeneous population her public school educators, her social workers, her police and correction agencies will have to make practical use of anthropological knowledge of the various peoples with whom they deal.

To sum up—the immigration problem which is of such dominant importance to-day is in all of its phases anthropological at base, and if we are to arrive at any correct solution of the questions of restriction, distribution and assimilation of the immigrant in America, use must be made of anthropological knowledge and data and research.

The second problem before our nation today which is at base anthropological which I wish to consider is the Negro problem. One person in ten in our nation is Negro. We know practically nothing of scientific anthropological value about the American Negro. Toward him there is more fierce race prejudice than toward any other people, yet probably no stronger ties of personal friendship exist between members of different races than exist between individual southern whites and southern Negroes. As to the relative intellectual capacity of the American Negro probably greater disagreement of opinion exists between white persons who think they know than about any other people. There is imperative need of scientific research and the accumulation of scientific data to help our nation in the solution of the Negro problem.

The careful student of our national affairs sees four great Negro movements setting in in America like deep-swelling tides.

The first is that of Negro segregation. A great natural segregation movement is taking place in at least three extensive areas in three southern states. Negroes flourish better than white people in those areas. The whites are decreasing and the Negroes increasing until they not only outnumber the whites, but outnumber them increasingly year by year. A similar natural segregation is taking place also in many of our large cities.

The national problem for us is what type of Negro and culture is being produced in the

areas of natural Negro segregation. As those areas to maintain men and culture of a fair level with the remainder of the nation, or will they be lowered so that a sort of cultural and physical quarantine would need to be maintained? Will those areas spread their inferiority out over their borders? Haiti and Liberia are contemporary examples of slackening Negro culture. We should study the tendencies of this movement in America—this unsought for, uninvited, unintended environmental segregation of the two peoples.

A second Negro movement is the present unprecedented acceleration of Negro migration from south to north. Ever since the Civil War the Negro has been a restless migrant, but during the past three years the migration has turned particularly away from the south, and one million or more Negroes have come directly from their old southern homes into our northern cities.

The south and the Negro mutually understand each other. The white south will tell you that it has no Negro "problem," because there is a perfectly understood procedure in all interrelations between individuals, or groups, of the two races. The north and the Negro are almost total strangers. If the Negroes become proportionately as numerous in the north as they are in the south, will the interrelations between the two peoples be similar to those now in the south where the public opinion and the practise of the white south is, as expressed to me by men in several different southern areas, just this—"The white man will run the south. Whether just or not, it is necessary." The recent northern race riots in East St. Louis, Omaha, Chicago and Duluth are, in this connection, suggestive.

The most accurate data should be at hand in regard to this northward migration, and daily research should be carried on in its many varying aspects. We need scientific facts to understand the tendencies of so unprecedented a movement.

In one aspect of this northward migration of Negroes decisive opinion should be uttered without further research, and that is the movement of alien Negroes into the United States—largely from the West Indies. Only those who are so uninformed as not to know we have a tragically serious Negro problem in America can, on any except selfish grounds, favor the admission of alien Negroes to America. Have we not wisdom and character enough to prevent the further aggravation of the problem by the admission of some 6,000 more such aliens yearly?

A third of these Negro movements is the amalgamation of the Negro and the white, and the consequent effacement of Negroes by their physical incorporation with the remainder of the nation's population.

The growth in the per cent. of mixed-bloods shows that an increasing per cent. of "Negroes" possess mates with white ancestry. Unless the tide turns the descendants of a very large per cent. of our present Negroes in time will be incorporated in the then American breed of men.

The migration of the Negro to our northern cities and the large per cent. of foreign-born whites in these cities greatly complicates this phase of the Negro question. The foreigner coming fresh to our shores almost entirely lacks the racial prejudice which is native to America. I was told in Cleveland last summer by a student of the problem there that in that city intermarriage between the Negroes and Italians is taking place at a rapid rate in the two chief Italian centers of residence.

A most careful and conclusive study of our people of Negro-white ancestry should be made that we may know how the wholesale absorption of our Negroes by our whites will affect the qualities of the nation as a whole. At no given era in history has one nation probably been inherently greatly superior or inferior to another in the same general stage of culture, yet some competing nations have gone down while others have advanced. Apparently very slight physical, intellectual or moral superiority is enough to give successful advantage, and very slight inferiority enough to result in disastrous disadvantage between two nations quite equally favored by environment. History has no truths to tell of the relative strength or weakness of a nation so largely

Negro as ours seems at present destined to become. If we are not to blunder on in the dark, it is well to learn what forecasts of the future can be made by asking scientific questions of the present.

The fourth Negro movement I shall note is that of growing political power due to developing race consciousness and purposeful organization for political action.

August 19, 1920, the newly elected president of the Universal Negro Improvement Association is quoted in the press as saying, "The day is not far distant when the Negro will be a power in politics." In the October, 1920, number of *The Journal of Negro History* an article by Norman B. Andrews entitled "The Negro in Politics," closes with these words:

> In several of the cities of the North there is such a large Negro population and so much appreciation among the Negroes of their political power that they are now launching a movement to nominate and elect members of their race to represent them in Congress. It is likely that this may soon be effected in Chicago, New York and Philadelphia.

The National Association for the Advancement of Colored People says that in 1913 it defeated bills in eleven states out of twelve which aimed to prevent Negro-white intermarriage.[10] When an organization in the interest of one race in America, a race which numbers one tenth of our total population, can control legislation in eleven out of twelve states as far separated as New York on the Atlantic and Washington on the Pacific, it is very evident that that race is rapidly becoming an important political factor in the life of our nation.

A few years ago one of the foremost administrators of research funds in the United States said the American Negroes could not be researched by his institution because they were a political factor in America. Is this not the all-sufficient reason why we should have all possible scientific data and knowledge concerning the Negro? The Negroes and whites in America have become too dynamic for national disaster longer to be trusted to adjust their differences mainly on the basis of race prejudice on the one hand, or unthoughtful sentimentality on the other.

I have endeavored to show in this paper that our nation should make large use of definite and specific anthropological knowledge to help insure her national development. I am as interested as any anthropologist in all research into the development of man. I am interested in the development of culture. I prize as one of my very richest experiences my intimate contacts with primitive peoples, but, as an American believing in America and her possibilities, I am to-day first of all anxious that anthropologists use their scientific knowledge to assist America in the solution of her momentous problems.

Albert Ernest Jenks
University of Minnesota

[10] Fourth Annual Report of the Board of Directors of the National Negro Protective Association.

A BRIEF HISTORICAL CONSIDERATION OF THE METRIC SYSTEM[1]

The World Metric Standardization Council wishes briefly to present to the Mathematical Association of America the desirability of enrolling actively in support of the adoption of the metric system in the United States. This organization is an advisory organization, unifying the efforts of all who are urging the adoption of the metric units of weights and measures throughout the United States, the British commonwealths and the world. There are no decimal dues, but contributions to the cause are welcome.

Whatever theoretical advantages a duodecimal or sixty system might have, the fact remains that man is ten-fingered and learns to count and reckon with these mechanical aids assisting in the process of computation, either consciously or unconsciously. Among civilizations reaching any high degree of culture, only two have carried to any extent any other than a decimal system The sixty system of the Babylonians and the twenty system of the

[1] Paper presented before the Mathematical Association of America, Chicago, Dec. 28, 1920.

Mayas of Yucatan are exceptions. However, even in these systems, the ten (or five) forms a subsidiary system, apparently developed first. The further important fact should be noted that with the development of these numerical systems, both these civilizations included their systems of weights and measures. We may even say that it appears probable that the system of weights and measures was first brought to the sixty system among the Babylonians, and weights and measures to the twenty system among the Mayans, and from this carried over to the number system. Note that this reduction took place in Babylon as much as four thousand years ago. These ancient civilizations found it necessary, then, to make their number systems conform to their systems of weights and measures, including time.

The first systematic treatise on decimal fractions was printed in 1585, first in Flemish and then in French, by Simon Stevin, of Bruges. This work is addressed to astronomers, surveyors, masters of money (of the mint), and to all merchants. Stevin says, of this work, that it treats of "something so simple, that it hardly merits the name of invention." He adds:

> We will speak freely of the great utility of this invention; I say great, much greater than I judge any of you will suspect, and this without at all exalting my own opinion. . . . For the astronomer knows, . . . the difficult multiplications and divisions which proceed from the progression with degrees, minutes, seconds and thirds . . . the surveyor, he will recognize the great benefit which the world would receive from this science, to avoid . . . the tiresome multiplications in Verges, feet and often inches, which are notably awkward, and often the cause of error. The same of the masters of the mint, merchants, and others. . . . But the more that these things mentioned are worth while, and the ways to achieve them more laborious, the greater still is this discovery *disme*, which removes all these difficulties. But how? It teaches (to tell much in one word) to compute easily, without fractions, all computations which are encountered in the affairs of human beings, in such a way that the four principles of arithmetic which are called addition, subtraction, multiplication and division, are able to achieve this end, causing also similar facility to those who use the casting-board (*jetons*). Now if by this means will be gained precious time; . . . if by this means labor, annoyance, error, damage and other accidents commonly joined with these computations, be avoided, then I submit this plan voluntarily to your judgment.

What can one add to these words of the first writer on the subject, and an independent discoverer of decimal fractions? All that Stevin says applies to-day, hardly with the change of a letter. The genius of Stevin is evident in the comprehensive grasp which he had of the universal application of decimal fractions to affairs. Much of the benefit of this invention is lost to us in America, because we persist in using non-decimal weights and measures.

LOUIS C. KARPINSKI
UNIVERSITY OF MICHIGAN

SCIENTIFIC EVENTS

THE ANNUAL MEETING OF THE BOARD OF TRUSTEES OF THE AMERICAN MUSEUM OF NATURAL HISTORY

A REPORT of the nature and scope of the past year's work of The American Museum of Natural History was made on the evening of February 7 by President Henry Fairfield Osborn, at the annual meeting of the board of trustees, which was held at the home of Dr. Walter B. James. The president regards the year 1920 as one of the greatest years in the history of the museum, inasmuch as the institution's educational value has for the first time been fully recognized by the present city administration, and gifts, collections and funds for expeditions presented to the museum represent a total of $500,000.

Commenting on the financial condition of the museum, it was announced that the year's work had been concluded without the necessity of requesting the trustees to make their usual personal contributions to supplement the budget. This was due to the enforcement of the most rigid economy and to the fact that the city authorities, after a searching investigation of its affairs, recognizing the importance of the institution as a vital and ever developing adjunct to the city's educational system, had increased the annual maintenance allowance by $150,000 over the appropriation

for 1919. Appreciation was also expressed for the generous response to requests for membership and for support of exploration work.

The popularity of the museum as an educational center was evidenced by the visits of 1,040,000 persons during the year.

Regarding the museum's work of cooperation with the public schools, it was reported that 1,180,000 students had made use of the nature study collections which are loaned, without cost, to the schools; that 88,000 pupils had attended the lectures in the museum provided so that they might visualize the subjects treated in their studies; that 1,650 blind children had "seen" the material selected for their use and attended special lectures; that 136,500 people had made use of the collections loaned to the public libraries; and that 116,500 slides had been distributed to public-school teachers to enable them to give illustrated talks on travel and natural history subjects to their pupils. A new line of contact with the schools has been developed through a series of background lectures, given by the museum staff to the city's teachers in training, designed to give the student teachers a greater fund of information and breadth of vision and to familiarize them with the museum material and the ways in which it can be used to supplement class-room work. As a further development of this cooperative work with the public-school system, the museum's department of health, at the request of the Board of Education, has prepared a set of twenty exhibits, each set including food models, composition blocks and charts, and constituting an aid to the instruction of school children in dietary hygiene.

EXPEDITIONS AND ACQUISITIONS OF THE AMERICAN MUSEUM

The field work of the year included several important expeditions. In September, an expedition financed by Mr. Harry Payne Whitney and headed by Mr. Rollo H. Beck, started on a five-years' investigation of the birds of Polynesia. This is the most important expedition ever sent into the field by the department of ornithology. Mr. George K. Chorrie collected birds in southern Ecuador, and Mr. Harry Watkins worked in Peru. Mr. H. E. Anthony collected mammals and vertebrate fossils in Jamaica and southern Ecuador. Mr. J. C. Bell obtained specimens and casts of sharks and rays at Cape Lookout, North Carolina. The department of anthropology continued excavations at the Aztec, New Mexico, ruin (which work was provided for by the Archer M. Huntington Fund), sent a party into the Grand Gulch region of Utah to explore cliff-dwellings, and began with the Bishop Museum of Honolulu a joint investigation of racial problems in Hawaii. Members of this department also represented the Museum in Honolulu at the First Pan-Pacific Scientific Congress, at which plans were made for future Polynesian exploration and investigation, in which the American Museum will participate. The department of geology made investigations in New York and Pennsylvania, Tennessee and Kentucky, Arizona, California and Hawaii, collecting in these regions being done by Curator E. O. Hovey, Associate Curator Chester A. Reeds, and Mr. E. J. Foyles. Messrs. Albert Thomson and George Olsen excavated large fossil vertebrates in Nebraska, for the department of vertebrate paleontology. Dr. Henry E. Crampton, curator of the department of invertebrate zoology, began an extended trip through the South Seas and the Far East. Dr. F. E. Lutz, associate curator of the same department, explored in Wyoming, Colorado, Idaho, Utah and Indiana, and Mr. F. E. Watson did field work in Jamaica. Mr. Paul Ruthling collected in Mexico and Mr. Elwood Johnson obtained specimens in Colombia for the department of herpetology. Through cooperation with the New York Zoological Society, under the supervision of Mr. C. William Beebe, collecting has been carried on for the museum in British Guiana at the Zoological Society's Tropical Research Station there.

Important new acquisitions made during the year, other than material secured by the expeditions just mentioned, included a large collection of paleolithic stone implements from Egypt, presented by August Heckscher;

a rich and varied collection of ethnological material secured by the Rev. H. B. Marx and presented by Mr. J. P. Morgan; a large archeological collection from Iroquois sites in New York state, received through bequest of Herbert M. Lloyd; a suite of 68 mineral specimens from France, presented by Professor Lacroix of Paris; minerals from Chili presented by Mr. H. F. Guggenheim, and from Bolivia, presented by Mr. H. C. Bellinger; a ball, 10 centimeters in diameter, carved from a flawless rock crystal and mounted on a bronze elephant of Hindu workmanship, presented by Messrs. Sidney and Victor Bevin; a Japanese topaz, cut egg-shape and covered with facets, weighing 1,463 carate, donated by Mr. M. L. Morgenthau; a collection of pearls and pearlaceous growths presented by Mr. George W. Korper; a collection of marine fishes from Peru; a number of Honolulu fishes; a collection of fresh water fishes from China; a series of paleolithic implements from North Africa, selected by the French archeologist, M. Henri Breuil, and purchased through the Morris K. Jesup Fund; 1,200 mammals from North China and Mongolia—the largest and most valuable collection the museum has ever received from Asia—secured by the Second Asiatic Expedition; and 3,378 specimens (the greater part of which represent species new to the museum's collections) collected by Rollo H. Beck in South America and the West Indies, and presented by Mr. Frederick F. Brewster. This last mentioned item is the most valuable gift the Department of Ornithology has ever received. The Hall of Geology has been reopened to the public, after extensive re-arrangement and improvement, which is not yet completed. The re-installation of the North Pacific Indian Hall was reported to be almost finished. Early in 1920, the American Museum purchased, through the Archer I. Huntington Fund, the pueblo ruin at Aztec, New Mexico, which it has been investigating for the last five years. It was announced last night that in due time this property as uncovered and partially restored by the museum will be presented to the United States to become a national monument and to be administered as a national park.

THE BIOLOGICAL FIELD STATION OF CORNELL UNIVERSITY

PARTLY by purchase and partly through the generosity of Mrs. Herman Bergholtz, Cornell University has acquired land for what Professor Needham characterizes as "the best biological field station in this country, if not in the world." The acquisition comprises nineteen and a half acres of land at the north end of the Bergholtz tract, north of Percy Field. It is bounded on the east by the Lake Road and on the west by Cayuga Street. In accordance with the specification of Mrs. Bergholtz that the money which her gift represents be used either for the endowment fund or that the land be developed and improved as the trustees should decide, it has been turned over to the College of Agriculture to be developed as an aquatic park and field station. Money for its development is already available from that appropriated by the legislature for the college building and improvement program. The gift will also be included in the endowment fund.

The waters of Indian Spring, which is included in the tract, will be used for trout ponds, and those of the lake will be used in other ponds and marshes where plants and animals may be studied in their native environment. An apiary and field station laboratory are planned, the latter to cost about $15,000. Because the area includes swamp, running water and high land, it is considered to be almost ideal for the purpose for which it will be used. Unlike the fresh water field stations along the Great Lakes, the weather conditions permit experimenters to work most of the year instead of only about six months.

Mayor Edwin C. Stewart, of Ithaca, has expressed the hope that the city may develop other land in the vicinity so that all of what is now waste land at the end of the lake may eventually be a park for public use.

AMERICAN FOUNDATION IN FRANCE FOR PREHISTORIC STUDIES

AT a meeting of the governing board of the American Foundation in France for Prehis-

toric Studies, held at the Hotel Plaza, New York, on February 3, 1921, Professor George Grant MacCurdy was elected first director of the foundation. Dr. Charles Peabody is chairman of the board and for the present will also serve as treasurer of the foundation.

The year's work will open at La Quina (Charente) on July 1. After a stay of some three months at La Quina, there will be excursions in the Dordogne, the French Pyrénés and to the Grimaldi caves near Mentone. The winter term will be in Paris; and the work of the spring term will include excursions to the important Chellean and Acheulian stations of the Somme valley, to Neolithic sites of the Marne or other suitable locality, and to Brittany for a study of megalithic monuments.

Students may enroll for an entire year or for any part thereof. Those who contemplate entering for either the year or the first term, should communicate immediately with the director, at Yale University Museum, New Haven, Conn.; or with Dr. C. Peabody, Peabody Museum, Cambridge, Mass.

One foundation scholarship of the value of 2,000 francs is available for the first year. The special qualifications of the applicant, together with references, should accompany each application. The foundation is open to both men and women students. The address of the director after June 15 will be care of Guaranty Trust Company, Paris.

SCIENTIFIC NOTES AND NEWS

Dr. Frank Billings, Chicago, has been elected president of the next congress of American Physicians and Surgeons, which meets in Washington, May 2–3, 1922.

At the recent meeting of the Mathematical Association of America the following officers were elected: *President,* Professor G. A. Miller; *Vice-presidents,* Professor R. C. Archibald and Professor R. D. Carmichael.

Dr. George Ellery Hale, director of the Mount Wilson Solar Observatory, has been awarded the Actonian prize by the Royal Institution of Great Britain in recognition of his work on solar phenomena.

Professor Henry Fairfield Osborn has been elected one of the vice-presidents of the Eugenics Education Society, of which Major Leonard Darwin is the president. The American committee of the Second International Eugenics Congress extended a special invitation to Major Darwin to attend the congress, but learned by his letter of December 1, 1920, that his health will not permit him to come. Invitations have been extended to several British, French and Scandinavian authors and writers in subjects of genetics and eugenics.

Dr. Graham Lusk has been elected corresponding member of the Société de Biologie of Paris.

Mme. Marie Curie has been invited to visit the United States and expects to come in May. Committees of reception have been appointed, including in their membership leading men of science. It is planned to present to Mme. Curie a gram of radium.

Dr. Henry Norris Russell, professor of astronomy and director of the observatory at Princeton University, has been appointed a research associate of the Mount Wilson Observatory of the Carnegie Institution of Washington for the current year. Dr. Russell has gone to England to receive the gold medal of the Royal Astronomical Society which was recently awarded him in recognition of his work on the evolutionary classification of stars. He expects to return in March to undertake his work at the Mount Wilson Observatory.

Harlow Shapley, of the Mount Wilson Solar Observatory, has been appointed observer at the Harvard College Observatory. and will enter upon his new work in March or April.

Dr. Henry H. Robinson, of New Haven, has been appointed superintendent of the Connecticut Geological and Natural History Survey to succeed Professor H. E. Gregory. His address is Hopkins Hall, Yale University, New Haven, Conn.

The trustees of Bernice Pauahi Bishop Museum of Polynesian Ethnology and Natural History at Honolulu, Hawaii, have appointed

as curator of collections Dr. Stanley C. Ball, professor of biology in the International Y. M. C. A. College, Springfield, Mass. Leaving Springfield in March Dr. Ball will visit museums in Albany, New York City, Philadelphia, Washington, Chicago and San Francisco, reaching Honolulu about May 1.

DR. RALPH C. RODGERS, previously in charge of the work in the physics of photography, at Cornell University, has been appointed assistant secretary of the illuminating engineering society.

THE board of trustees of the American Medical Association reelected the following members of the Council on Pharmacy and Chemistry: L. G. Rowntree, Rochester, Minn.; Torald Sollman, Cleveland, and Lafayette B. Mendel, New Haven; and to fill a vacancy occasioned by the resignation of Professor Henry Kraemer, Dr. Charles W. Edmunds, professor of therapeutics and materia medica, University of Michigan.

PROFESSOR DEXTER S. KIMBALL, of Cornell University, represented the American Society of Mechanical Engineers and the federated American engineering societies at the annual convention of the Engineering Institute of Canada, at Toronto.

AT the next meeting of the Canadian Research Council, to be held in Ottawa, February 19, an interim appointment of chairman will be made to succeed Dr. A. B. Macallum, who resigned to accept the chair of biochemistry in McGill University, Montreal. The appointment of a permanent chairman will depend on the action of the federal government.

DR. LYNDS JONES, of the department of zoology of Oberlin College, announces a special trip under the auspices of the summer school, through the northwest, terminating in the town of Mora, Washington, on the Pacific coast. A special study of insect, bird, plant and animal life will be made and attention will be given to topographical geology. The trip will probably be made by automobile and will be in the field for eight weeks.

DR. L. O. HOWARD, chief of the Bureau of Entomology, retiring president of the American Association for the Advancement of Science, delivered an address on "How the government is fighting insects," before the Washington Academy of Sciences on February 17.

DR. A. N. RICHARDS, professor of pharmacology, University of Pensylvania, will deliver the seventh Harvey Society Lecture at the New York Academy of Medicine on Saturday evening, February 26. His subject will be "Kidney function."

DR. GEORGE THOMAS STEVENS, of New York City, author of contributions to opthalmology and neurology, died on January 30 at the age of eighty-eight years.

DR. HENRY HARRINGTON JANEWAY, of New York City, known for his work on cancer, attending surgeon to the Memorial Hospital, died on February 1, at the age of forty-seven years.

PROFESSOR HENRY MATTHEW STEPHENS, since 1899 professor of biology in Dickinson College, died on February 5, aged fifty-four years.

DR. LEOPOLD LANDAU, professor of surgery at Berlin, died on December 28, 1920, at the age of seventy-two years.

A REGULAR meeting of the American Physical Society will be held in Fayerweather Hall, Columbia University, New York, on Saturday, February 26, 1921. If the length of the program requires it, there will also be sessions on Friday, February 25. Other meetings for the current season are as follows: April 22–23, 1921, Washington; August 4, 5, 1921, Pacific Coast Section at Berkeley.

THE Royal Agricultural College at Cirencester, the oldest place of agricultural instruction in the British Empire, is threatened with extinction at the end of the year unless a minimum capital sum of £25,000 can be raised by private munificence to save it. The college, which was founded seventy-five years ago under the patronage of the Prince Consort, has since 1915 been occupied by a girls' school from the east coast, whose tenancy ends at Christmas. The Ministry of Agricul-

ture are asking the governors to reopen the college for its originally intended purposes, and have promised, subject to certain conditions a small, annual grant towards its maintenance. The governors are anxious to take this course, they have considered and approved a curriculum of greater general utility and of a more practical character than that formerly pursued at the college, and have conditionally secured the services of a principal of exceptional qualifications. In an appeal issued on behalf of the governors, Lord Bledisloe (chairman) and Lord Bathurst (vice-chairman) urge that "never, in the best interests of British Agriculture, was there greater need than there is to-day for the practical training of our present and future landowners, estate agents and larger farmers in improved methods of agriculture, in the economic administration of rural estates, in practical forestry, or in local government."

We learn from the *Journal* of the American Medical Association that the Academia de Ciencias Médicas of Havana has announced the following prizes for the year 1921: President Gutiérrez' prize, 400 pesos, for the best work on the necessity of a National Formulary; Gañongo prize, 200 pesos for the best work on any medical subject; Gordon prize (physiology), a gold medal, for the best work on correlation of the endocrine glands. The papers must be sent to the secretary of the academy (calle de Cuba, número 84-A) before March 31, 1921. They must be original, must not have been published before, and may be in Spanish, English or French.

New Year honors conferred in Great Britain on scientific men are recorded in *Nature* as follows: *Privy Councillor:* The Rev. Dr. Thomas Hamilton, for service to the cause of education in Ireland, first as President of Queen's College, Belfast, and afterwards as President and Vice-Chancellor of the Queen's University of Belfast. *Knights:* Pro-P. R. Scott Lang, for more than forty years Regius professor of mathematics in the University of St. Andrews; Mr. P. J. Michelli, secretary to the London School of Tropical Medicine; Dr. S. S. Sprigge, editor of the *Lancet;* Professor James Walker, professor of chemistry, University of Edinburgh; and Dr. Dawson Williams, editor of the *British Medical Journal. C.M.G.:* Mr. I. B. Pole Evans, chief of the division of botany and plant pathology, Department of Agriculture, Union of South Africa. *C.I.E.: Lieutenant-Colonel* W. F. Harvey, director of the Central Research Institute, Kasauli, Punjab, and Dr. E. J. Butler, formerly Imperial Mycologist, Pusa. *K.C.V.O.:* Dr. F. S. Hewett.

The *Journal* of the American Medical Association states that its Paris exchanges for the last week in December were crowded with accounts of the elaborate festivities of the centenary of the Academy of Medicine. The entire issue of the *Presse médicale* for December 25 is devoted to an illustrated description, with the addresses delivered by Laveran, the present president of the academy, and others. The official delegates from other countries included sixteen from England, five from the United States; eleven from Belgium, including Bordet, Brachet and Willems; Arteaga, from Bolivia; O. de Oliveira, from Brazil; Córdova, Donoso, Orego and Sierra, from Chile; Esguerra and Machado from Colombia; Cueva and Villamar, from Ecuador; Nourgo and Nobles from Guatemala; Arce and Chutro, from Argentina; two delegates also from Peru; Silva, from Salvador; Carlos, Fonseca, Tijera, Rincones, Rísquez and Velásquez, from Venezuela; Ito and Tsuchiga from Japan; O. Pei-Huan, from China; Robert from Siam, and Cassens from Haiti. Twenty-nine countries were represented in all. A medal to commemorate the occasion was struck. The president of the republic of France was present with two of his ministers and all the préfets of the département. The celebration concluded with a banquet and a reception at the Palais d'Orsay. Toasts were offered at the banquet by Cassens, for Haiti; Recasens, for Spain; van der Berg, for Holland; Cueva, for Ecuador; Kalliontzis, for Greece, and Lucatello, for Italy. Wright, of England, was seated at the right hand of the president of the academy.

WE learn from *Nature* that the British Air Ministry announces that the cabinet has approved, subject to parliamentary sanction, the grant of a sum for the direct assistance of civil aviation. During the financial year 1921–22 payments under this grant will be limited to a maximum sum of £60,000, and will be made to British companies operating on approved aerial routes. The routes at present approved are London to Paris, London to Brussels, and London to Amsterdam. Extensions to these routes and additional routes, such as England–Scandinavia, on which the possibilities of a service employing flying boats or amphibian machines or a mixed service of sea and land aircraft can be demonstrated, may be approved.

UNIVERSITY AND EDUCATIONAL NEWS

ANNOUNCEMENT has been made at Brown University of the completion of the Nathaniel French Davis Fund in honor of Professor Davis, now emeritus, who was for forty-one years a teacher of mathematics in the university. The fund amounts to ten thousand dollars and the income is to supplement the regular library appropriations in purchasing mathematical books and periodicals for the mathematical seminary.

DR. VICTOR C. VAUGHAN, for thirty years dean of the University of Michigan Medical School, has resigned. Dr. Vaughan has been professor of hygiene and physiological chemistry since 1884.

AT Colgate University, Associate Professor A. W. Smith has been made full professor and head of the department of mathematics as successor to Professor J. M. Taylor. Professor T. R. Aude, of the Carnegie Institute of Technology, has been appointed associate professor of mathematics.

DR. SOLON MARX WHITE, Minneapolis, professor of medicine at the University of Minnesota, has been appointed chief of the department of medicine to succeed Dr. Leonard G. Rowntree, now associated with the Mayo Clinic.

DISCUSSION AND CORRESPONDENCE

ON THE OCCURRENCE OF AËDES SOLLICITANS IN FRESH WATER POLLUTED BY ACID WASTE

IT is believed to be of interest to students of mosquitoes to report the occurrence of *Aëdes sollicitans,* a salt marsh mosquito, in fresh water polluted by acid waste from a "guano factory." During October, 1920, while making investigations concerning fishes in relation to mosquito control at Savannah, Georgia, in cooperation with the U. S. Public Health Service and the city of Savannah, the writer found mosquito larvæ in ditches which were so strongly polluted that all other animal life appeared to be extinct. The larvæ were collected from time to time and reared to the adult stage. Dr. Bassett, bacteriologist for the city of Savannah, identified the species as *Aëdes sollicitans* and this determination later was verified by Dr. Dyar, of the U. S. Bureau of Entomology.

The acid content of the water in the ditches where the pollution was greatest was not determined but a water sample taken downstream where the pollution had become greatly diluted and where *Aëdes sollicitans* was replaced by *Anopheles crucians* and *Culex* sp. was titrated by Dr. Bassett and found to contain 2.08 per cent. of free acid and a large amount of iron. It is quite probable that the water in portions of the ditches in which the larvæ of *Aëdes sollicitans* were common had an acid content of fully 3 per cent.

The larvæ occurred most frequently along the edges of the ditches among decaying vegetation and they displayed a stronger resistance to the toxicity of oil than *Culex* and *Anopheles* larvæ occurring in the more weakly polluted portions of the same ditches.

SAMUEL F. HILDEBRAND
U. S. BUREAU OF FISHERIES,
WASHINGTON, D. C.

THE HISTORY OF SCIENCE AND THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

THE application made to the council of the American Association for the Advancement of Science for the organization of a new Section to be devoted to the History of Science was de-

nied by the council (October 17, 1920), but permission was granted for those interested in the History of Science to enter Section L on "Historical and Philological Sciences," a Section which had never been organized and existed only in name.

The special committee appointed by the president of the association for the organization of a History of Science Section, recommended, on December 16, 1920, that the words "and philological" be dropped. This recommendation was likewise rejected by the council. It is clear, therefore, (1) that the council does not deem it wise to admit a separate section on the History of Science and (2) that the organization effected in Chicago on December 29, 1920, will not meet the needs of the increasing number of men interested in the History of Science, since, at any time, those representing "Philological Sciences" and the "Historical Sciences" (whatever that term may mean), may step in and give rise to a heterogeneous, incoherent group of workers, having no interests in common. If representatives of the "Philological Sciences" and "Historical Sciences" do not appear, then Section L constitutes in reality the very kind of organization which the council decreed should not be admitted as a Section.

In the judgment of the present writer, the dignified and logical procedure for those interested in the History of Science is, therefore, to withdraw altogether from organized historical work in connection with the American Association for the Advancement of Science until such time when the council and general session will be ready to welcome them into the association as a separate Section.

Florian Cajori

University of California

Concerning "Aerial Photo-Hydrography"

In an article[1] describing attempts to photograph "the small coral heads and pinnacle rocks" off the coast of Florida, E. Lester Jones of the United States Coast and Geodetic Survey concludes that:

> These experiments proved very conclusively that photographs from the air, using present-day equipment, are of little practical value to the hydrographer (p. 575).

Those interested in the study of underwater features may be interested in the opposite view published in *Comptes Rendus*.[2] Objects in French water were photographed to a maximum depth of 17 m. and several points of rock were revealed by the photographs which had escaped detection by other methods. ("Plusieurs têtes de roche qui avaient échappé aux levés détaillés et trés exacts de ces parages ont été ainsi révélées par la photographie.") Specific instances are given where points of rock dangerous to shipping, not indicated on the hydrographic charts, were discovered by means of the photographs.

Perhaps the statement that photographs taken from the air are of little practical value is more conclusive than was intended.

Willis T. Lee

U. S. Geological Survey

Soil Color Standards

In order that there may be uniformity in the designation of the color of soils it is proposed that a set of color standards be prepared in which those colors which occur in soils and subsoils may be represented. Such a set of standard colors would be of great value to soil survey workers and would certainly lead to a better understanding of the descriptions of soils from the various regions of the United States and of the earth as a whole.

In order that such a set of color standards might be published representative soils from all parts of the United States would need to be examined. No doubt the Bureau of Soils of the United States Department of Agriculture could lead in the work and by consultation with various State Soil Surveys and with the Soil Surveys of other nations standardize the colors and publish reproductions of them as Robert Ridgway did in his "Color Standard and Color Nomenclature" (published by

[1] Science, December 17, 1920.

[2] Tome 169, 27 October, 1919.

the author, Washington, D. C., 1912). If it should seem impracticable to name all colors, a numerical system could be devised. The writer has felt the need of some such set of color standards in the Soil Survey work in South Dakota. Perhaps others may have felt the same need.

J. G. HUTTON

S. D. EXPERIMENT STATION

SCIENTIFIC BOOKS

The Letters of William James. Edited by his son, HENRY JAMES. Two volumes, xx + 348 and xiii + 382, The Atlantic Monthly Press, Boston, 1920. $10.00.

William James was one of the half dozen greatest Americans of his generation; he was also a past master of writing. Every one with intellectual interests will wish to read his letters. They will be well rewarded, whether they seek better acquaintance with a great man, or literature itself, or stimuli to reflections upon the conditions of scholarly and scientific work in America.

The most notable fact about James himself which the letters reveal and emphasize is that he was from youth a philosopher and moralist, tremendously interested in the world as a whole and in its deeper meanings. Painting, natural history and medicine, each for a brief time, and psychology for almost a score of years, restrained him from the study of fundamental questions and sweeping statements which really had his life-long allegiance. At the age of twenty-six, while studying medicine and expecting to earn his living by practising it, and while gaining considerable acquaintance with the best work of the time in physiology and psychology, he was reading Hegel and writing that Kant's "Kritik" "strikes me so far as almost the sturdiest and honestest piece of work I ever saw." In the partial list of his readings during the half year after he took his M.D. philosophy and religion outweighed science and medicine nearly ten to one.

In respect to the actual working of James's intellect, the letters probably do not add much to what the shrewd reader would infer from the "Principles of Psychology," the "Varieties of Religious Experience," "Pragmatism" and other writings. The letters show brilliantly the extreme fertility of mind, the receptivity to facts, theories and viewpoints of all sorts, the impulsive reaction to approve and make the best out of every man's offering, the intuitive sense of causes and consequences, and the perfect candor and directness. They do not show so well the sheer mastery in observing and organizing the facts of human nature and behavior, the final recognitions of truth and value, and the persistent refusal to tolerate inadequacies or imperfections by which James worked his way to them.

As literature the letters have the verve, the magic gift of epithet and the utter sincerity which, writing or speaking, James never lacked. His caricature, or possibly characterization, of the university professor will be often quoted:

> —a being whose duty is to know everything, and have his own opinion about everything, connected with his *Fach*. . . . has the most prodigious faculty of appropriating and preserving knowledge, and as for opinions, he takes *au grand sérieux* his duties there. He says of each possible subject, "Here I must have an opinion. Let's see! What shall it be? How many possible opinions are there? three? four? Yes! just four! Shall I take one of these? It will seem more original to take a higher position, a sort of *Vermittelungsansicht* between them all. That I will do, etc., etc." So he acquires a complete assortment of opinions of his own; and, as his memory is so good, he seldom forgets which they are! But this is not reprehensible; it is admirable—from the professorial point of view.

He tells his little daughter of a big mastiff:

> The ears and face are black, his eyes are yellow, his paws are magnificent, his tail keeps wagging *all* the time, and he makes on me the impression of an angel hid in a cloud. He longs to do good.

Of the subtleties in the theme and treatment of his brother's latest novels he writes:

> You know how opposed your whole "third manner" of execution is to the literary ideals which

animate my crude and Orson-like breast, mine being to say a thing in one sentence as straight and explicit as it can be made, and then to drop it forever; yours being to avoid naming it straight, but by dint of breathing and sighing all round and round it, to arouse in the reader who may have had a similar perception already (Heaven help him if he hasn't!) the illusion of a solid object, made (like the "ghost" at the Polytechnic) wholly out of impalpable materials, air, and the prismatic interferences of light, ingeniously focused by mirrors upon empty space. But you *do* it, that's the queerness! And the complication of innuendo and associative reference on the enormous scale to which you give way to it does so *build out* the matter for the reader that the result is to solidify, by the mere bulk of the process, the like perception from which *he* has to start. As air, by dint of its volume, will weigh like a corporeal body; so his own poor little initial perception, swathed in this gigantic envelopment of suggestive atmosphere, grows like a germ into something vastly bigger and more substantial.

To this Henry James replied with unparalleled conciseness,

> You shall have, after a little more patience, a reply to your so rich and luminous reflections on my book—a reply almost as interesting as, and far more illuminating than, your letter itself.

Of a night in the Adirondacks he writes:

> I was in a wakeful mood before starting, having been awake since three, and I may have slept a little during this night; but I was not aware of sleeping at all. My companions, except Waldo Adler, were all motionless. The guide had got a magnificent provision of firewood, the sky swept itself clear of every trace of cloud or vapor, the wind entirely ceased, so that the fire-smoke rose straight up to heaven. The temperature was perfect either inside or outside the cabin, the moon rose and hung above the scene before midnight, leaving only a few of the larger stars visible, and I got into a state of spiritual alertness of the most vital description. The influences of Nature, the wholesomeness of the people round me, especially the good Pauline, the thought of you and the children, dear Harry on the wave, the problem of the Edinburgh lectures, all fermented within me till it became a regular Walpurgis Nacht. I spent a good deal of it in the woods, where the streaming moonlight lit up things in a magical checkered play, and it seemed as if the Gods of all the nature-mythologies were holding an indescribable meeting in my breast with the moral Gods of the inner life. . . . The intense significance of some sort, of the whole scene, if one could only *tell* the significance; the intense inhuman remoteness of its inner life, and yet the intense *appeal* of it; its everlasting freshness and its immemorial antiquity and decay; its utter Americanism, and every sort of patriotic suggestiveness, and you, and my relation to you part and parcel of it all, and beaten up with it, so that memory and sensation all whirled inexplicably together; it was indeed worth coming for, and worth repeating year by year, if repetition could only procure what in its nature I suppose must be all unplanned for and unexpected. It was one of the happiest lonesome nights of my existence, and I understand now what a poet is.

It would be unwise, within the limits of this review, to discuss the "Letters" as evidence concerning the forces which determine intellectual production and moral zeal in men of science. The readers of this journal will also prefer to draw their own conclusions. I note only a few matters which might not attract attention.

James writes apologetically of having the sole copy of the "Principles" insured for $1,000 in transit! In 1896, being then fifty-four, under the spell of Chicago,

> I tried a stenographer and typewriter with an alleviation that seemed almost miraculous. I think I shall have to go in for one some hours a week at Cambridge. It just goes "whiff" and six or eight long letters are *done*.

Apparently he had spent seven years in Europe before ever going west of the Adirondacks; and seems not to have visited Yale or Princeton or Johns Hopkins or Columbia until he was fifty.

James's output seems to have been influenced greatly by outside pressure. Except for the enterprise of a publisher and the existence of the lecture foundations of Gifford, Lowell and the Columbia Department of Psychology, we might well have gone without the "Principles," "Varieties," and "Pragmatism," though we might, of course, have had something better. In the

prime of his life, when his ability was entirely obvious, James taught logic to beginners, extra courses in Radcliffe, and courses in summer schools! EDWARD L. THORNDIKE

SPECIAL ARTICLES

NON-DISJUNCTION OF THE FOURTH CHROMOSOME OF DROSOPHILA

IN *Drosophila melanogaster* the gene for "eyeless" (e) and its normal allelomorph (E) are situated in the small fourth chromosome. Normal eye is dominant.

When heterozygous Ee normal flies are crossed with eyeless ee, a ratio of 1:1 is expected. Actually this ratio is approached, although the greater viability of the normal type modifies the ratio to approximately 1.3:1.

In a single mating of this sort a count of 171 normal to 206 eyeless was obtained. Breeding tests of the descendants of this mating indicate that in all probability non-disjunction of the fourth chromosome has taken place.

If an Ee fly formed non-disjunctional gametes Ee and—, the cross with an ee individual would give rise to Eee flies. Here two doses of "eyeless" meet one of "normal" eye. The opportunity is given for an upset in the balance of dominance between E and e. The excess of eyeless flies, mentioned above, suggests that such an upset has taken place. Further matings make it appear that the Eee form may be *either* normal or eyeless in appearance, certain individuals being extremely difficult to classify.

In the course of the breeding work several interesting results were obtained. Among these was the isolation of *eyeless* flies, theoretically of the formula Eee, which when crossed *inter se* or with other eyeless ee, gave *normal eyed* progeny in considerable numbers. Ratios of 8, 9, 10 or even 12 normals to 1 eyeless were also produced from matings presumably EEe × Ee. Both these conditions were expected on the hypothesis of non-disjunction.

Using the appearance of eyeless flies as a test, it seems that the mitosis of the Eee flies is in the vast majority of cases, if not always, Ee and e; while similarly that of the EEe flies is Ee and E.

The variation in somatic appearance of the Eee form and the selective type of mitosis, referred to above, make it difficult to demonstrate genetically the presence of EeEe individuals. If flies of this type have occurred their mitosis is commonly Ee and Ee. One mating only indicates a possible exception to this type of mitosis. This mating shows a peculiar ratio possibly due to the presence of eee eyeless forms.

A further detailed report of the work will shortly be published. I am greatly indebted to Dr. E. G. Anderson for helpful suggestions and discussion and to the Misses E. E. Jones and D. M. Newman for assistance in the laboratory.

C. C. LITTLE

COLD SPRING HARBOR, N. Y.,
January 6, 1921

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

REPORT OF THE TREASURER FOR 1920

IN conformity with Article 2, Section 6, of the By-Laws and by direction of the Council, the Treasurer has the honor to submit the following report for the period December 20, 1919, to December 23, 1920.

The total cash receipts during the period in question is $13,096.05. These include $4,381.21 from the W. Hudson Stephens estate; $1,850 from 32 Life Membership commutations, and $5,707.75 from interest on securities of the association.

The total disbursements made during the period in question amount to $10,272.56. These include an aggregate of $4,500 for 19 grants authorized by the council, and $4,431.31 paid for $4,500 face value Victory Loan 4¾% bonds.

The total amount of funds of the association consisting of cost value of securities purchased, appraised value of securities received from the Colburn Estate, and cash in banks, is $125,723.59.

A balance sheet, showing assets and liabilities, and tables showing details of receipts and disbursements, are appended hereto.

(Signed) ROBERT S. WOODWARD,
Treasurer

Dated December 23, 1920

BALANCE SHEET—DECEMBER 23, 1920

Assets

Investments:		
Securities (Exhibit "A")		$119,242.41
Cash in Banks		6,481.18
		$125,723.59

Liabilities

Funds:		
Life Memberships:		
345 at $50	$17,250	
5 at $100	500	$ 17,750.00
Jane M. Smith Fund		5,000.00
W. Hudson Stephens Fund		4,381.21
Colburn Fund		77,755.74
Accumulated Investments		14,355.46
Unappropriated Interest		6,481.18
		$125,723.59

CASH STATEMENT

Receipts

Dec. 23, 1920.			
Balance from last report			$3,657.69
Interest from securities	$5,707.75		
Interest from bank balance.	51.72		
Interest from R. M. Yerkes.	5.37		
Revertment of grant made R. M. Yerkes	100.00		
10 Life Commutations, 1919	500.00		
22 Life Commutations, 1920:			
17 at $50	$850		
5 at $100	500	1,350.00	
Sustaining member		1,000.00	
Estate of W. H. Stephens.		4,381.21	13,096.05
			$16,753.74

Disbursements

Investments			
$ 100 U. S. First Liberty Loan 4%		$91.25	
$4,500 U. S. Victory Loan Bonds 4¾%:			
Purchase price.	$4,381.60		
Interest purchased	46.90		
Commission	2.81	4,431.31	$ 4,522.56
Grants:			
Samuel D. Robins		100.00	
S. Lefschetz		300.00	
Olive C. Hazlett		100.00	
A. A. Knowlton		200.00	
John C. Shedd		100.00	
Philip Fox		600.00	
Anne S. Young		100.00	
Frank B. Taylor		250.00	
S. I. Kornhauser		250.00	
P. W. Whiting		200.00	
Donald Reddick, Chr.		500.00	
Irving W. Bailey		500.00	
Daniel W. La Rue		200.00	
Margaret F. Washburn		200.00	
Jos. Peterson		200.00	
Asa A. Schaeffer		200.00	
Theo Hough		100.00	
Carl J. Wiggers		150.00	
Ferdinand Canu		250.00	4,500.00
Interest on Life Membership			
350 members at $3		1,050.00	
2 members (Jane M. Smith Fund)		200.00	1,250.00
Cash in Banks			
Fifth Avenue Bank		5,271.26	
U. S. Trust Company		1,209.92	6,481.18
			$16,753.74

I certify that I have audited the accounts of the Treasurer of the American Association for the Advancement of Science for the period December 20, 1919, to December 23, 1920; that the securities representing the investments of the association have been exhibited and verified; and that the income therefrom has been duly accounted for.

The financial statements accompanying the Treasurer's report are in accord with the books of the association and correctly summarize the accounts thereof

(Signed) Herbert A. Gill,
Auditor

Dated December 23, 1920

At the autumn meeting of the executive committee of the council, held in New York on October 17, 1920, the following report was received and ordered to be printed in Science. It covers only a portion of the fiscal year on account of the fact that the records of the Permanent Secretary's office were turned over to the new Permanent Secretary on April 1, 1920. The former Permanent Secretary, Dr. L. O. Howard, presented his resignation at the St. Louis meeting, at which he was elected president for 1920 and 1921, but the new Permanent Secretary, Dr. Burton E. Livingston, did not assume his duties until February 1, 1920, and did not actually take charge of the accounts until April 1, 1920. During the interim Dr. Howard continued to care for the affairs of the association, and he has given much valuable advice and assistance to the new Permanent Secretary. Dr.

SCHEDULE OF SECURITIES

Securities Purchased

Par Value		Purchase Value	
$10,000	Chicago & Northwestern Railway Co. general mortgage 4 per cent. bonds, due 1987	$9,425.00	
10,000	Atchison, Topeka & Santa Fe Railway Co. general mortgage 4 per cent. bonds, due 1995	9,287.50	
10,000	Great Northern Railway Co. first and refunding mortgage 4.25 per cent. bonds, due 1961	10,050.00	
10,000	Pennsylvania Railroad Co. consolidated mortgage 4.5 per cent. bonds, due 1960	10,487.50	
10,000	Chicago, Burlington & Quincy Railroad Co. general mortgage 4 per cent. bonds, due 1958	9,350.00	
10,000	Union Pacific Railroad Co. first lien and refunding mortgage 4 per cent. bonds, due 2008	9,012.50	
10,000	Northern Pacific Railway Co. prior lien railway and land grant 4 per cent. bonds, due 1997	9,187.50	
10,000	New York Central and Hudson River Railroad Co. 3.5 per cent. bonds, due 1997	8,237.50	
100	U. S. First Liberty Loan Bonds	91.25	
8,000	U. S. Second Liberty Loan Bonds	8,000.00	
2,000	U. S. Third Liberty Loan Bonds	2,000.00	
2,000	U. S. Fourth Liberty Loan Bonds	2,000.00	
6,500	U. S. Victory Liberty Loan Bonds	6,373.66	$93,502.41
	Bonds from Colburn Estate		
20,000	Acker, Merrall and Condit Co. debenture 6 per cent. bonds	$13,600.00	
7,000	Buffalo City Gas Co. First mortgage 5 per cent. bonds	1,540.00	
8,000	Park and Tilford Co. sinking fund debenture 6 per cent. bonds	6,400.00	
42,000	Pittsburgh, Shawmut & Northern Railroad first mortgage 4 per cent. bonds, due February 1, 1952	4,200.00	25,740.00
$171,000			$119,242.41

Howard's audited report for the period mentioned follows.

BURTON E. LIVINGSTON,
Permanent Secretary

October 23, 1920

PERMANENT SECRETARY'S REPORT FOR THE PERIOD NOVEMBER 1, 1919, TO MARCH 31, 1920

Dr.

To balance from last account		$5,988.90
To receipts from members:		
Annual dues previous to 1919	$119.00	
Dues for 1919	237.00	
Dues for 1920	36,367.50	
Admission fees	725.00	
Life membership fees	1,150.00	
Publications and misc. receipts	284.63	38,883.13
		$44,872.03
By publications:		
To publishers SCIENCE		$8,909.16
By expenses St. Louis meeting:		
Secretaries (sectional and press)	$709.26	
Other meeting expenses	328.02	1,037.28
By office expenses:		
Salaries	2,461.02	
Extra clerical help	1,233.42	
Postage, telegraph, telephone and express	891.13	
Addressograph supplies, etc.	397.45	
Stationery, forms, cards, circulars, etc.	2,040.84	
Overpaid dues returned	8.00	7,031.86
By balance turned over to Burton E. Livingston, new Permanent Secretary		27,893.73
		$44,872.03

L. O. HOWARD,
Permanent Secretary

I hereby certify that I have audited the foregoing accounts and find the same correct, and that proper vouchers covering disbursements were exhibited.

HERBERT A. GILL,
Auditor

WASHINGTON, D. C.,
October 12, 1920

FINANCIAL REPORT OF THE PERMANENT SECRETARY FOR THE PARTIAL YEAR, APRIL 1, 1920, TO SEPTEMBER 30, 1920[1]

Burton E. Livingston, permanent secretary, in account with the American Association for the Advancement of Science.

[1] See the report of Dr. L. O. Howard for the period from November 1, 1919, to March 31, 1920.

Dr.

To balance turned over by L. O. Howard, April 1, 1920:		
Checking account	$23,692.64	
Savings account	4,201.09	$27,893.73
To receipts from members:		
Annual dues previous to 1919	$31.00	
Annual dues 1919	79.50	
Annual dues 1920	11,121.50	
Annual dues 1921 (paid in advance)	204.18	
Admission fees	230.00	
Life membership fees	200.00	11,866.18
To other receipts:		
Sales of publications	$10.75	
Miscellaneous receipts including postage, exchange on checks, overpayments on dues, etc.	137.43	
Interest on savings account.	26.25	174.43
		$39,934.34

Cr.

By Publications:		
Publishers SCIENCE		$21,204.31
By Division Expenses (refunds on memberships):		
Pacific Division	$1,755.00	
Southwestern Division	105.00	1,860.00
By Expenses, Washington Office:		
Salary Permanent Secretary	$1,250.01	
Salary, Executive Assistant	1,195.00	
Salary, Clerk	454.84	
Salary, F. S. Hazard	200.00	
Extra clerical help	400.00	
Travel expenses, Permanent Secretary	120.27	
Office supplies	354.75	
Stationery and printing	1,979.53	
Telephone and telegraph and express	74.28	
Furniture	219.81	
Postage	545.32	
Exchange on checks	11.72	
Bad checks of members unredeemed	10.00	
Duplicating work	25.93	$6,841.46
By miscellaneous expenses:		
Life membership commutations, to Treasurer	$500.00	
Travel expenses, Executive Committee	169.02	
Expenses, Grants Committee	33.95	
Refunds of overpaid dues.	131.00	
Refunds of payments for old membership lists	4.50	
Refunds to academies on national members having paid dues for 1920	557.00	
Membership in American Council on Education	10.00	
Moving to third floor	5.00	
Notary fees	.25	
Expenses of Committee on Permanent Secretary	33.00	
Loss on Canadian Currency	.26	1,443.98
		$31,349.75
By new balances:		
American National Bank:		
Checking account	$4,344.04	
Savings account	4,227.34	
Petty cash fund	13.21	8,584.59
		$39,934.34

I certify that I have audited the accounts of the Permanent Secretary of the American Association for the Advancement of Science for the period April 1, 1920, to September 30, 1920; that they were found correct, and that proper vouchers covering disbursements were exhibited.

(Signed) HERBERT A. GILL,
Auditor

WASHINGTON, D. C.,
January 17, 1921

SCIENCE

A Weekly Journal devoted to the Advancement of Science, publishing the official notices and proceedings of the American Association for the Advancement of Science

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